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13/Appeal Brief
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Pedro S. Baranda, et al.

Serial No.: 09/031,108

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Title: Tension Member for an Elevator

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Art Unit: 3652

Assistant Commission for Patents
Washington, DC 20231
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APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES PURSUANT TO 37 C.F.R.§1.191

1. REAL PARTY IN INTEREST

The real party in interest is Otis Elevator Company. The assignment of assignor's interest was recorded on June 12, 1998 at reel 9248, frame 0387.

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

Claims 2-14, 16-22 and 66-75 are pending in this Application.

Claims 71-75 were withdrawn from consideration by the Examiner as being drawn to a non-elected invention.

Claims 2-14, 16-22 and 66-70 were rejected.

Claims 11, 12, 17 and 66-70 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2-11, 13, 14, 16, 18-20 and 66-70 were rejected under 35 U.S.C. 102(b) as being clearly anticipated by Coleman et al.

Claims 2, 5-11, 13, 14, 16, 18-20, 66 and 68-70 were rejected under 35 U.S.C. 102(b) as being clearly anticipated by Puzik.

Claims 2, 7, 11 and 16 were rejected under 35 U.S.C. 102(b) as being clearly anticipated by either UK 1,401,197 or Pearson or SU 1216120 or Meurer.

Claims 3 and 4 were rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Puzik in view of Coleman.

Claims 12 and 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Greening in view of Coleman.

Claims 21 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over either Coleman or Puzik.

4. STATUS OF AMENDMENTS

No amendments were submitted in response to the Final Rejection.

5. SUMMARY OF INVENTION

Claim 2 of the present invention is directed to a tension member for providing lifting force to a car of an elevator system. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes a plurality of individual load-carrying ropes encased within a coating layer, with the coating layer separating the ropes. The coating layer defines an engagement surface for the tension member to engage a sheave of the elevator system.

A principle feature of the tension member is the flatness of the tension member. By using a shape other than round, the maximum rope pressures within the tension member as it travels over the elevator sheave are reduced as compared to round ropes. The advantage is that the elevator system may use smaller sheaves without causing significant degradation to the tension member. Smaller sheaves results in smaller torque

loads on the elevator machine, and thereby smaller, less expensive machines and machine drives.

Another feature of the present invention is the separation of the load carrying portion of the tension member into separate, individual ropes. The result of this feature is that each individual rope has a smaller diameter than a conventional rope having similar load carrying capacity, which typically have multiple strands and/or cords wrapped together into a bundle. The smaller diameters of the individual ropes further reduces the maximum rope pressures in the tension member and permits further reductions in the elevator sheave diameter, along with the associated smaller torque loads and smaller, less expensive machines and drives.

The combination of these principal features, aspect ratio greater than one, individual, separated ropes, and a coating layer to separate the ropes and provide an engagement surface, produces a tension member that is highly effective as a tension member for providing lifting force and traction in an elevator system.

Support for Claim 2 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6.

Claim 66 is also directed to similar subject matter as claim 2. Claims 3, 7-10, 18-20 depend from Claim 2 and incorporate additional novel features into the present invention. These claims (2-3, 7-10, 18-20 and 66) are grouped together for this Appeal as a result of being directed to similar patentable subject matter as described above with respect to Claim 2.

Claim 3 adds an element of having the individual ropes formed from strands of non-metallic material. This element provides the additional benefit of being lightweight so that the tension member further reduces the loads when applied to an elevator system. In addition, such materials improve the flexibility of the tension member, which further reduces the permissible bending radius of the tension member. Support for Claim 3 can be found on page 4, line 6 to 14 and page 6, line 24 to 26, and in figures 1-6.

Claim 7 adds an element of the aspect ratio being greater than two. Further increasing the aspect ratio results in a tension member that is flatter and, therefore, increases the benefits of minimizing rope pressure within the tension member. Support

for Claim 7 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6.

Claim 8 adds an element of spacing the individual ropes widthwise within the coating layer. This particular embodiment provides for a more uniform distribution of rope pressure within the tension member. Support for Claim 8 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6 a, b and c.

Claim 9 adds an element of the coating layer defining a single engagement surface for the individual ropes. This particular embodiment maximizes the traction benefits of the coating layer as it applies to a tension member in an elevator system. Support for Claim 9 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6.

Claim 10 adds an element of the coating layer having an engagement surface that extends about the plurality of individual ropes. This particular embodiment results in an extended engagement surface, which is favorable for applications that require all sides of the tension member to be engagement surfaces, such as elevator ropes having reverse bends in them such that both sides of the tension member engage elevator sheaves. Support for Claim 10 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6.

Claims 18 and 19 add an element of having the individual ropes arranged linearly. Similar to Claim 8, this particular embodiment provides for a even more uniform distribution of rope pressure within the tension member. Support for Claims 18-19 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6.

Claim 20 adds an element of having the individual ropes be round in cross-section. The benefit of this particular embodiment is that the individual ropes can be conventionally fabricated, which may save costs, while the complete tension member can take advantage of the other features (aspect ratio greater than one, separated ropes, coating layer). Support for Claim 20 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6a.

Claim 4 of the present invention is directed to a tension member for providing lifting force to a car of an elevator system. The tension member has an aspect ratios greater than one, i.e., the tension member is not round, and wherein the tension member is formed from strands of non-metallic material.

A principle feature of the tension member of Claim 4 is the flatness of the tension member. By using a shape other than round, the maximum rope pressures within the tension member as it travels over the elevator sheave are reduced as compared to round ropes. The advantage is that the elevator system may use smaller sheaves without causing significant degradation to the tension member. Smaller sheaves results in smaller torque loads on the elevator machine, and thereby smaller, less expensive machines and machine drives.

Another feature of the present invention is the use of non-metallic material for the tension member. Such materials provide the advantages of high strength, light weight and, in particular, increased flexibility as compared to metallic load carrying materials. The increased flexibility element results in further reductions in the permissible bending radius of the tension member. The latter is particularly applicable to tension members applied in elevator lifting applications that require the tension member to rotate around a sheave. In this application, the sheave can be made with a smaller diameter, which further reduces the torque load on the machine and, thereby, the size and cost of the elevator system.

The combination of these principal features, aspect ratio greater than one and tension member formed from non-metallic materials, produces a tension member that is highly effective as a tension member for providing lifting force and traction in an elevator system.

Support for Claim 4 can be found on page 4, line 6 to 14 and page 6, line 24 to 26, and in figures 1-6.

Claim 67 is also directed to similar subject matter as Claim 4 and therefore Claims 4 and 67 are grouped together.

Claims 5 and 6 are directed to a tension member for providing lifting force to a car of an elevator system. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes a plurality of individual load-carrying

ropes encased within a coating layer, with the coating layer separating the ropes. The coating layer defines an engagement surface for the tension member to engage a sheave of the elevator system. Further, the coating layer blocks differential motion of the plurality of individual ropes.

A principle feature of this claimed invention, in addition to those described with respect to Claim 2 from which Claims 5 and 6 depend, is the use of a coating layer to block differential motion of the individual ropes. This feature provides the benefit of enhanced durability of the tension member.

As a result of being directed to similar subject matter, claims 5 and 6 are grouped for the purpose of this Appeal.

Support for claims 5 and 6 can be found on page 6, line 28 to page 7, line 2.

Claim 11 of the present invention is directed to a tension member for providing lifting force to a car of an elevator system, and in particular an elevator system having sheaves with non-linear engagement surfaces. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes an engagement surface that is contoured to complement the non-linear engagement surface of the elevator sheave.

A principle feature of the tension member of Claim 11 is the flatness of the tension member. By using a shape other than round, the maximum rope pressures within the tension member as it travels over the elevator sheave are reduced as compared to round ropes. The advantage is that the elevator system may use smaller sheaves without causing significant degradation to the tension member. Smaller sheaves results in smaller torque loads on the elevator machine, and thereby smaller, less expensive machines and machine drives.

Another feature of the present invention is the contoured engagement surface of the tension member. This contoured surface adapts the tension member to provide the benefit of enhanced traction when applied to particular applications, such as an elevator system having sheaves with non-linear engagement surfaces.

Support for the invention of Claim 11 can be found on page 11, lines 11-17 and in Figure 5.

Claim 68 is also directed to similar subject matter as Claim 11. Claim 12 incorporates an additional novel feature of having the engagement surface of the tension member shaped by the outer surface of the ropes. This embodiment provides a convenient method to contour the outer surface of the tension member to enhance the traction characteristics of the tension member. As a result of being directed to similar patentable subject matter, Claims 11, 12 and 68 are grouped together for the purpose of this Appeal.

Claim 13 of the present invention is directed to a tension member for providing lifting force to a car of an elevator system. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes a coating layer formed from an elastomer.

A principle feature of the tension member of Claim 13 is the flatness of the tension member. By using a shape other than round, the maximum rope pressures within the tension member as it travels over the elevator sheave are reduced as compared to round ropes. The advantage is that the elevator system may use smaller sheaves without causing significant degradation to the tension member. Smaller sheaves results in smaller torque loads on the elevator machine, and thereby smaller, less expensive machines and machine drives.

Another feature of the present invention is the coating layer formed from elastomer. The elastomer coating provides a medium that is durable, resistant to environmental factors, provides a suitable material for the engagement surface, in particular for traction purposes, and which transmits loads through the tension member.

Support for the invention of Claim 13 can be found on page 6, line 28- page 7, line 6.

Claim 69 is directed to similar subject matter as Claim 13 and, therefore, Claims 13 and 69 are grouped for the purposes of this Appeal.

Claim 16 of the present invention is directed to a tension member for providing lifting force to a car of an elevator system. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes an engagement surface shaped to provide a guidance mechanism for the tension member, particularly during engagement with a sheave of an elevator system.

A principle feature of the tension member of Claim 16 is the flatness of the tension member. By using a shape other than round, the maximum rope pressures within the tension member as it travels over the elevator sheave are reduced as compared to round ropes. The advantage is that the elevator system may use smaller sheaves without causing significant degradation to the tension member. Smaller sheaves results in smaller torque loads on the elevator machine, and thereby smaller, less expensive machines and machine drives.

Another feature of the present invention is the shaped engagement surface. Of particular importance with the use of non-round tension members is the need to maintain proper tracking of the tension member if it is engaged with a sheave. The use of a shaped engagement surface provides a guidance mechanism for the tension member.

Support for Claim 16 can be found on page 11, lines 11-17 and in Figure 5.

Claim 70 is also directed to similar subject matter as Claim 16. Claim 17 incorporates an additional novel feature of having the engagement surface of the tension member shaped by the outer surface of the ropes. This embodiment provides a convenient method to contour the outer surface of the tension member to enhance the traction characteristics of the tension member. As a result of being directed to similar patentable subject matter, Claims 16, 17 and 70 are grouped together for the purpose of this Appeal.

Claims 21 and 22 of the present invention are directed to a tension member for providing lifting force to a car of an elevator system. The tension member has an aspect ratios greater than one, i.e., the tension member is not round, and includes a plurality of individual load-carrying ropes having aspect ratios greater than one and which are encased within a coating layer, with the coating layer separating the ropes. The coating layer defines an engagement surface for the tension member to engage a sheave of the elevator system.

A principle feature of this claimed invention, in addition to those described with respect to Claim 2 from which Claims 21 and 22 depend, is the use of non-round or flat individual ropes within the coating layer. This feature further enhances the flexibility and reduces the permissible bending radius of the tension member.

As a result of being directed to similar subject matter, claims 21 and 22 are grouped for the purpose of this Appeal.

Support for Claims 21 and 22 is found on page 9, lines 3-14 and figures 6 b-d.

Claim 71 is directed to an elevator system having a car, a sheave, and a tension member. The tension member is engaged with the car and the sheave and has an aspect ratio greater than one, i.e., the tension member is not round, and includes a plurality of individual load-carrying ropes encased within a coating layer, with the coating layer separating the ropes. The coating layer defines an engagement surface for the tension member to engage a sheave of the elevator system.

Although the invention claimed in Claim 71 includes many of the same features (and their associated benefits) as the invention of Claim 2, it should be noted that Claim 71 is directed to an elevator system having such a tension member, while Claim 2 is directed to a tension member for providing lifting force to a car of an elevator system. Therefore, Claim 71 is grouped separately from Claim 2.

Support for Claim 71 can be found throughout the specification and, in particular, from page 3, line 10 to page 4, line 5 and page 6, line 22 to page 9, line 2, and in figures 1-6.

Claim 72 is directed to an elevator system having a car, a sheave, and a tension member. The tension member is engaged with the car and the sheave and has an aspect ratio greater than one, i.e., the tension member is not round, and wherein the tension member is formed from strands of non-metallic material.

Although the invention claimed in Claim 72 includes many of the same features (and their associated benefits) as the invention of Claim 4, it should be noted that Claim 72 is directed to an elevator system having such a tension member, while Claim 4 is directed to a tension member for providing lifting force to a car of an elevator system. Therefore, Claim 72 is grouped separately from Claim 4.

Support for Claim 72 can be found on page 4, line 6 to 14 and page 6, line 24 to 26, and in figures 1-6.

Claim 73 is directed to an elevator system having a car, a sheave, and a tension member and, in particular, an elevator system having sheaves with non-linear engagement surfaces. The tension member has an aspect ratio greater than one, i.e., the

tension member is not round, and includes an engagement surface that is contoured to complement the non-linear engagement surface of the elevator sheaves.

Although the invention claimed in Claim 73 includes many of the same features (and their associated benefits) as the invention of Claim 11, it should be noted that Claim 73 is directed to an elevator system having such a tension member, while Claim 11 is directed to a tension member for providing lifting force to a car of an elevator system. Therefore, Claim 73 is grouped separately from Claim 11.

Support for Claim 73 can be found on page 11, lines 11-17 and in Figure 5.

Claim 74 is directed to an elevator system having a car, a sheave, and a tension member. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes a coating layer formed from an elastomer.

Although the invention claimed in Claim 74 includes many of the same features (and their associated benefits) as the invention of Claim 13, it should be noted that Claim 74 is directed to an elevator system having such a tension member, while Claim 13 is directed to a tension member for providing lifting force to a car of an elevator system. Therefore, Claim 74 is grouped separately from Claim 13.

Support for Claim 74 can be found on page 6, line 28- page 7, line 6.

Claim 75 is directed to an elevator system having a car, a sheave, and a tension member. The tension member has an aspect ratio greater than one, i.e., the tension member is not round, and includes an engagement surface shaped to provide a guidance mechanism for the tension member, particularly during engagement with a sheave of an elevator system.

Although the invention claimed in Claim 75 includes many of the same features (and their associated benefits) as the invention of Claim 16, it should be noted that Claim 75 is directed to an elevator system having such a tension member, while Claim 16 is directed to a tension member for providing lifting force to a car of an elevator system. Therefore, Claim 75 is grouped separately from Claim 16.

Support for Claim 75 can be found on page 11, lines 11-17 and in Figure 5.

6. ISSUES

(1) Whether the withdrawal from consideration by the Examiner of Claims 71-75 was proper in view of the prior election made by Applicants?

(2) Whether Claims 11, 12, 17 and 66-70 are indefinite under 35 U.S.C. 112, second paragraph?

(3) Whether Claims 2-11, 13, 14, 16, 18-20 and 66-70 are anticipated by Coleman et al.?

(4) Whether Claims 2, 5-11, 13, 14, 16, 18-20, 66 and 68-70 are anticipated by Puzik?

(5) Whether Claims 2, 7, 11 and 16 are anticipated by either UK 1,401,197 or Pearson or SU 1216120 or Meurer?

(6) Whether Claims 3 and 4 are anticipated by Puzik in view of Coleman?

(7) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 3 and 4 as unpatentable over Puzik in view of Coleman?

(8) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 12 and 17 as unpatentable over Greening in view of Coleman?

(9) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 21 and 22 as unpatentable over either Coleman or Puzik?

7. GROUPING OF THE CLAIMS

For the purposes of this Appeal, claims 2-14, 16-22 and 66-75 do not stand or fall together and will be addressed in the following groups:

Group 1: Claims 2-3, 7-10, 18-20 and 66;

Group 2: Claims 4 and 67

Group 3: Claims 5 and 6

Group 4: Claims 11-12 and 68

Group 5: Claims 13-14 and 69

Group 6: Claims 16-17 and 70

Group 7: Claims 21-22

Group 8: Claim 71

Group 9: Claim 72

Group 10: Claim 73

Group 11: Claim 74

Group 12: Claim 75

An explanation of why the Applicant believes the identified groups of claims are separately patentable is presented in the Summary of the Invention section above.

8. ARGUMENT

(1) Whether the withdrawal from consideration by the Examiner of Claims 71-75 was proper in view of the prior election made by Applicants?

During a telephone conversation on June 11, 1999, Examiner presented Applicants with a restriction requirement. This restriction requirement was to the following inventions:

Claims 1-22, drawn to a tension member;

Claims 23-43, drawn to a traction drive in combination with an elevator system;

Claims 44-57, drawn to a sheave; and

Claims 58-65, drawn to a liner.

A provisional election to claims 1-22 was made by Applicants' representative during the telephone conversation. This provisional election was affirmed as part of the response filed along with Amendment A, on July 20, 1999.

Amendment A added new claims 66-75. Claims 66-70 are directed to a tension member. Claims 71-75 are directed to an elevator system having a tension member with similar claim elements as those of elected Claims 2, 4, 11, 13 and 16, respectively (and also Claims 66-70, respectively).

The Final Rejection dated September 28, 1999 withdrew Claims 71-75 from further consideration by the Examiner as being made to a non-elected Invention in accordance with the election in Paper No. 8 ("Amendment A").

Applicants disagree with this characterization of its election in Paper No. 8 and with its use to withdraw Claims 71-75 from consideration. A proper Restriction must provide support for both the distinctness between the alleged different inventions and the increased burden on the Examiner if required to examiner both groups of claims. In this instance, Applicants was not presented with a Restriction Requirement between Claims 1-22 and Claims 71-75 in the Final Rejection. Therefore, there has been no support for either the distinctness or the increased burden and, in fact, there has not even been an allegation by the Examiner that these claims are distinct or that there is an increased burden.

Claims 1-22 were directed to a tension member for an elevator system. Claims 71-75 are directed to an elevator system having a tension member. The features of both groups of claims are similar and it is not apparent what, if any, increased burden will be incurred during the examination.

Further, the non-elected claims are directed to a drive system, a sheave and a liner. Claims 71-75 are not consonant with any of these non-elected claims, which were addressed as part of the election made by Applicants. As a result, new Claims 71-75 must be either consonant with elected claims 1-22 (and should be examined as part of the present application) or are another, separate group of claims. If the latter, then proper support must be in the record for this restriction. Otherwise, Applicants may be subject at a later date to claims of double patenting.

Therefore, the withdrawal from consideration of Claims 71-75 should be reversed or, as minimum, Examiner should be required to provide proper support for this new restriction requirement.

(2) Whether Claims 11, 12, 17 and 66-70 are indefinite under 35 U.S.C. 112, second paragraph?

Examiner alleges that it is unclear from Claims 11, 12, 17 and 66-70 if Applicants intent is to claim merely the tension member for providing lifting force or the tension member in combination with an elevator system. Therefore, Examiner has rejected these claims under 35 U.S.C. 112, second paragraph.

Section 35 U.S.C. 112 requires that the claims particularly point out and distinctly claim the subject matter that applicants regard as their invention. The claim language chosen by Applicants is directed to physical features of the tension member. To help clarify these features, they are additionally described with elements of the environment of the invention to define the function of those features. The intent of the chosen language is to more clearly define the claimed physical features.

Claim 11 clearly claims a tension member having an engagement surface that is contoured. Using the description in the specification as a guide, it is clear that this element refers to an engagement surface that is not planar (see the description on page 11, lines 8-17 and figures 4 and 5). In order to further define and clarify, however, Applicants have chosen to provide some functional language to describe this contoured engagement surface and its function. This functional language brings into the claim the element of the contoured surface being complementary to a surface the tension member may engage, i.e., the non-linear engagement surface of an elevator sheave.

Claim 12 provides even further definition in that the engagement surface of the tension member is shaped by the outer surface of the ropes encased within the coating layer, and provides further definition of the function (enhanced traction) of this shaping of the engagement surface of the tension member. It is clear from this claim language how the tension member is shaped and what is the function of this claimed shape. It should also be noted that, although the function of this claimed element may involve other non-claimed elements, the definition of the tension member and the shape of the

engagement surface is completely defined by the elements of the claimed tension member.

Claim 17 is similar to claim 12 in that the elements of the claimed invention are clearly defined as a tension member having an engagement surface shaped by the outer surface of the ropes encased within the coating layer. As discussed above with respect to Claim 12, although the function of this claimed element may involve other non-claimed elements, the definition of the tension member and the shape of the engagement surface is completely defined by the elements of the claimed tension member.

Claims 66-70 define a tension member having an engagement surface that is capable of transferring traction forces into the tension member. The environment of having the tension member engaged with a traction sheave provides way to further describe and define the function of this engagement surface.

Therefore, Claims 11, 12, 17 and 66-70 meet the requirements of 35 U.S.C. 112, second paragraph and this rejection should be reversed.

(3) Whether Claims 2-11, 13, 14, 16, 18-20 and 66-70 are anticipated by Coleman et al.?

For a claim rejection under 35 U.S.C. 102 to be valid, each and every element of the claim must be disclosed in the reference cited[1]. No structural or functional difference between a claimed invention and the prior art may be ignored[2] and the Examiner must show where the reference discloses explicitly, or inherently, each such element.

Therefore, for this rejection to be proper, Coleman has to disclose each and every element of the claimed inventions. Coleman discloses a feeder or traveling cable that supplies electrical power to an elevator car.

The elements of Claim 2 require a tension member that has an aspect ratio greater than one, i.e., the tension member is not round, and includes a plurality of individual load-carrying ropes encased within a coating layer, with the coating layer separating the

[1] Atlas Powder v. E.I. du Pont, 750 F.2d 1569, 224 U.S.P.Q. 409 (Fed. Cir 1984); Jamesbury Corp. v. Litton Industrial Products, 756 F.2d 1556, 225 U.S.P.Q. 253 (Fed. Cir. 1985).
[2] Lewmar Marine, Inc. v. Barient, 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987); Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 USPQ 592 (Fed. Cir. 1983).

ropes. Finally, Claim 2 requires that the coating layer define an engagement surface for the tension member to engage a sheave of the elevator system.

First, this cable does not provide lifting force to an elevator, it provides electrical power. It is abundantly clear to one skilled in the art that there is a significant difference between electrical cables and lifting ropes. Second, Coleman does not disclose a plurality of individual load-carrying ropes that could perform the function of providing lifting force to an elevator car. Finally, Coleman does not include a coating layer that defines an engagement surface for the tension member to engage a sheave of an elevator system. Coleman is simply a flat electrical cable that provides electrical power to an elevator car. It does not disclose or suggest that it could be used as to provide lifting force, that it even has individual load-carrying ropes, or that it includes a surface that could be used as an engagement surface with a sheave.

Further, Coleman et al. does not teach or suggest the claimed invention. The fact that the cable of Coleman et al. is not meant to be used as a traction cable is supported by the proposed S-Z lay of the ropes as illustrated in figure 1(c). This type of lay is disclosed in Coleman et al. to be used with electrical conductors as a way to shift tensile loads between the strength members and the electrical conductors. Cables having the configuration disclosed in Coleman, with or without the electrical conductors, are insufficient for the stress levels to which elevator traction ropes are subjected.

Therefore, Coleman et al. does not anticipate or make obvious the invention of Claim 2 and this rejection of Claim 2 should be reversed.

Claims 3, 7-10, 18-20 all depend from Claim 2 and Claim 66 includes similar elements as Claim 2, and therefore this rejection has the same inadequacies as described above with respect to this rejection of Claim 2. Therefore, this rejection of Claims 3, 7-10, 18-20 and 66 should be reversed.

Claim 4 requires a tension member for providing lifting force to an elevator car and that is formed from strands of non-metallic material. As discussed above, Coleman et al. is an electrical cable, not a lifting cable. There is no disclosure or suggestion in Coleman et al. that it could be used as a lifting cable. Therefore, this rejection of Claim 4 should be reversed.

Claims 5 and 6 depend from Claim 2 and this rejection of Claim 5 should be reversed for the same reasons as discussed above with respect to Claim 2. In addition, Claim 5 requires an additional element of having a coating layer that blocks longitudinal differential motion of the plurality of strands. There is no disclosure in Coleman et al. of a coating layer that performs this function, nor is there any indication in Coleman et al. if the coating layer could perform such a function, or even recognition that it might be desirable. Further, Claim 6 requires that the coating layer retains each of the ropes to block the occurrence of differential motion. Again, there is no indication in Coleman et al. of this element or the recognition of the desirability of this element. Therefore, this rejection of Claims 5 and 6 should be reversed.

Claim 11 requires the element of having a contoured engagement surface. As described above, Coleman et al. is an electrical cable and it does not disclose or suggest a tension member having an engagement surface as claimed in Claim 11. Further, the outer surface of Coleman et al., even if it could be remotely suggested to be an engagement surface, is clearly not contoured as required in Claim 11.

Therefore, this rejection of Claim 11 should be reversed.

Claim 13 is directed to a tension member for providing lifting force to an elevator car and further that the tension member have a coating layer formed from elastomer. As discussed above with respect to Claim 2, Coleman et al. is an electrical cable and does not disclose or suggest a tension member for providing lift. Therefore, this rejection has the same inadequacies as described above with respect to the rejection of Claim 2 and should be reversed.

Claim 16 requires the element of the tension member having a shaped engagement that functions to guide the tension member during engagement with a sheave. Coleman et al. does not disclose this element as its out surface is clearly not shaped for any guidance purpose and, since it is a simple electrical cable, there is no suggestion in Coleman et al. of the need or desire to use its outer surface as a guidance mechanism. Therefore, this rejection of Claim 16 should be reversed.

(4) Whether Claims 2, 5-11, 13, 14, 16, 18-20, 66 and 68-70 are anticipated by Puzik?

For a claim rejection under 35 U.S.C. 102 to be valid, each and every element of the claim must be disclosed in the reference cited[3]. No structural or functional difference between a claimed invention and the prior art may be ignored[4] and the Examiner must show where the reference discloses explicitly, or inherently, each such element.

Puzik discloses a continuous belt for a belt drive mechanism for an automotive application. It does not disclose a tension member for providing lifting force to an elevator system, nor does it disclose a tension member including an engagement surface for engaging a traction sheave of the elevator system. A drive belt for an automotive application is clearly not sufficient as a tension member to support elevator loads. In addition, drive belts such as these are closed loop and unidirectional. Neither of these features is practical in an elevator application.

As for Claims 2, 7-10, 18-20 and 66, Puzik fails to disclose each and every element of the claims. First, it fails to disclose a tension member for providing lifting force to a car of an elevator system. Second, it fails to disclose a coating layer that defines an engagement surface for engaging a rotating sheave of an elevator system. Therefore, this rejection of Claims 2, 7-10 and 18-20 is improper and should be reversed.

Further, with respect to Claim 10, Puzik fails to disclose a tension member that has a coating layer that define an engagement surface that extends about the plurality of individual ropes. In particular applications, this element provides a tension member that can be used in a system having reverse bends. In an application such as Puzik, there are no reverse bends and there is no indication or teaching of such a tension member.

As for Claims 5 and 6, there is no disclosure or suggestion in Puzik of a coating layer that blocks longitudinal differential motion of the plurality of individual ropes or a coating layer that retains each of the ropes to block the occurrence of differential motion. Therefore, Puzik fails to disclose each and every element of Claims 5 and 6 and this rejection should be reversed.

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[3] Atlas Powder v. E.I. du Pont, 750 F.2d 1569, 224 U.S.P.Q. 409 (Fed. Cir 1984); Jamesbury Corp. v. Litton Industrial Products, 756 F.2d 1556, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

[4] Lewmar Marine, Inc. v. Barient, 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987); Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 USPQ 592 (Fed. Cir. 1983).

As for Claims 11, 16, 68 and 70, Puzik fails to disclose a tension member for providing lifting force to an elevator car, and that includes a contoured or shaped surface for either traction enhancement or as a guidance mechanism. Therefore, Puzik fails to disclose each and every element of Claims 11 and 16 and this rejection should be reversed.

As for Claims 13, 14 and 69, Puzik fails to disclose a tension member for providing lifting force to an elevator car. Therefore, this rejection should be reversed.

(5) Whether Claims 2, 7, 11 and 16 are anticipated by either UK 1,401,197 or Pearson or SU 1216120 or Meurer?

For a claim rejection under 35 U.S.C. 102 to be valid, each and every element of the claim must be disclosed in the reference cited[5]. No structural or functional difference between a claimed invention and the prior art may be ignored[6] and the Examiner must show where the reference discloses explicitly, or inherently, each such element.

For clarity, each item of prior art used in this rejection will be addressed separately except for UK 1,401,197 and Pearson, since they disclose similar subject matter.

First, UK 1,401,197 and Pearson disclose the use of flat, strap steel as an elevator rope. It is important to note that these ropes are formed from a laterally continuous strap of steel, with the outer surface of this metal strap forming the engagement surface with the elevator sheave.

As for Claims 2 and 7, both of these claimed inventions require a tension member having a plurality of load-carrying members encased within a common layer of coating, wherein the coating layer defines an engagement surface for the tension member. Both UK 1,401,197 and Pearson fail to disclose either the plurality of load-carrying members or the coating layer. Therefore, both UK 1,401,197 and Pearson fail to meet the requirements of a valid 35 U.S.C. 102(b) anticipatory rejection and this rejection should be reversed.

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[5] Atlas Powder v. E.I. du Pont, 750 F.2d 1569, 224 U.S.P.Q. 409 (Fed. Cir 1984); Jamesbury Corp. v. Litton Industrial Products, 756 F.2d 1556, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

[6] Lewmar Marine, Inc. v. Barient, 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987); Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 USPQ 592 (Fed. Cir. 1983).

As for Claims 11 and 16, it is to be noted not only do both U.K. 1,401,197 and Pearson disclose the use of flat, laterally continuous, steel straps as elevator ropes, the engagement surfaces disclosed in both references are smooth and flat. Neither of these references disclose or suggest the use of tension members having an engagement surface that is shaped or contoured.

Claim 11, in contrast, requires a contoured engagement surface that provides a mechanism to enhance the traction of the tension member. Claim 16, requires a shaped surface that provides a mechanism to guide the tension member. In both U.K. 1,401,197 and Pearson the traction is provided by the surface interaction between the smooth surface of the steel strap and the guidance of the ropes is provided, if at all, by other mechanisms.

Therefore, UK 1,401,197 and Pearson fail to disclose each and every element of Claims 11 and 16 and this rejection should be reversed.

Turning to SU 1216120, this reference discloses the use of a toothed belt engaged with a mechanism that lifts the toothed belt, tooth by tooth, over a stationary toothed disc. The elevator car is not moved by traction forces but by the lifting force of the multi-roller carrier, with the toothed belt and disc engagement providing a mechanical holding mechanism. Such a device, if it even works, is not practical in elevator applications.

This reference fails to disclose a tension member having an engagement surface engageable with a traction sheave. There is no rotatable sheave disclosed in this reference and therefore no indication or suggestion that the toothed belt of this reference could be used as a tension member for engaging a rotatable sheave.

As for Claims 2 and 7, there is no disclosure or suggestion of a plurality of load-carrying ropes encased with a common layer of coating, with the coating layer defining an engagement surface. Therefore, this rejection of Claims 2 and 7 should be reversed.

As for Claims 11 and 16, while the toothed belt could be viewed as having a contoured surface, there is not disclosure of a rotatable sheave and therefore no disclosure or suggestion to contour the surface of the tension member for either traction or guidance. Therefore, this rejection of Claims 11 and 16 should be reversed.

Turning to Meurer, this reference discloses a drum type device to move sludge collectors in a basin. The tension members in this device are formed from steel tape,

which, as discussed above with respect to U.K. 1,401,197 and Pearson, has the limitation of being flat, smooth and laterally stiff. Further, Meurer does not disclose tension members that provide lifting force to an elevator car. The tension members disclosed in Meurer move sludge collectors laterally along the basin. There is no disclosure or suggestion that such a device could be used to lift an elevator car. In addition, the driving mechanism of Meurer is a drum type machine. The tension members disclosed in Meurer do not have an engagement surface to engage a traction sheave since there is no traction sheave. This engagement surface in traction systems uses friction to provide the mechanism for moving the elevator loads and the mechanism to hold the elevator car. In drum drive systems such as Meurer or other winch type systems, the tension member is fixed to the drum to provide both the force to move the loads and the holding force for the loads. Therefore, such systems do not disclose or teach tension members having engagement surfaces for engaging a traction sheave.

As for Claims 2 and 7, both of these claimed inventions require a tension member having a plurality of load-carrying members encased within a common layer of coating, wherein the coating layer defines an engagement surface for the tension member. Meurer fails to disclose either the plurality of load-carrying members or the coating layer. Therefore, Meurer fails to meet the requirements of a valid 35 U.S.C. 102(b) anticipatory rejection and this rejection of Claims 2 and 7 should be reversed.

As for Claims 11 and 16, it is to be noted not only does Meurer disclose the use of flat, laterally continuous, steel straps with a drum type device, the engagement surfaces disclosed in both references are smooth and flat. Neither of these references disclose or suggest the use of tension members having an engagement surface that is shaped or contoured. Therefore, Meurer fails to meet the requirements of a valid 35 U.S.C. 102(b) anticipatory rejection and this rejection of Claims 11 and 16 should be reversed.

(6) Whether Claims 3 and 4 are anticipated by Puzik in view of Coleman?

For a claim rejection under 35 U.S.C. 102 to be valid, each and every element of the claim must be disclosed in the reference cited[7]. No structural or functional difference

[7] Atlas Powder v. E.I. du Pont, 750 F.2d 1569, 224 U.S.P.Q. 409 (Fed. Cir 1984); Jamesbury Corp. v. Litton Industrial Products, 756 F.2d 1556, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

between a claimed invention and the prior art may be ignored[8] and the Examiner must show where the reference discloses explicitly, or inherently, each such element.

First, for a proper 35 U.S.C. 102(b) rejection, the elements of the claims must be disclosed, either explicitly, or inherently, in a single reference. Therefore, this rejection is improper and should be reversed.

Further, as discussed above with regards to the previous rejections using Puzik, this reference fails to disclose a tension member for providing lifting force to an elevator car. In addition, Coleman et al. is an electrical cable and also fails to disclose a tension member for providing lifting force to an elevator car. Therefore, this combination, even if proper, fails to disclose each and every element of the claimed invention of claims 3 and 4.

Further still, this combination of Puzik and Coleman et al. is not proper. Puzik is an automotive drive belt and Coleman et al. is an electrical cable. No one skilled in the art of elevator ropes (or automotive drive belts or electrical cables, for that matter) would combine these two references to produce applicants' invention. Tension members for lifting elevator cars are entirely different from drive belts, which themselves are entirely different from electrical cables. There is no motivation in Puzik that an electrical cable could be used as a substitute or in combination with Puzik, nor is there any motivation in Coleman et al. for such a combination. In this sense it is clear that the Examiner is using hindsight reconstruction in order to fabricate a combination that meets the requirements of the claimed invention of Claims 3 and 4.

Therefore, this rejection of Claims 3 and 4 should be reversed.

(6) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 3 and 4 as unpatentable over Puzik in view of Coleman?

Applicants respectfully submit that the Examiner has not met the burden of proof required to support a rejection under 35 U.S.C. §103. When an application is submitted to the Patent and Trademark Office, case law dictates that 35 U.S.C. §103 places the burden of

[8] Lewmar Marine, Inc. v. Barient, 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987); Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 USPQ 592 (Fed. Cir. 1983).

proof on the PTO to establish a prima facie case of obviousness.[9] Once the prima facie case has been established, then the burden of going forward with the evidence to rebut the prima facie case shifts to the applicant. Only the burden of going forward with evidence to rebut shifts to the applicant, however. The burden of persuasion remains with the PTO.

Further, in order to support a prima facie obviousness type rejection, the Examiner must take into account all the limitations in the rejected claim[10], including any limitations expressed using functional language[11]. Further, the obviousness must be determined based on the claimed subject matter as a whole, including any results and advantages produced by the claimed subject matter[12]. In addition, a prima facie case of obviousness in not proper and cannot be made if the suggested modification of a reference destroys the intent, purpose or function of the invention disclosed in the reference[13]. Finally, if the prior art actually teaches away from the claimed invention, this is highly probative, objective criteria fully capable of serving as a foundation for patentability[14] and defeats a rejection's authority as establishing prima facie obviousness[15].

For the reasons discussed in the previous section of this Appeal Brief, this rejection should be reversed.

First, the combination of these references is not proper. Coleman, as discussed above, is an electrical feeder or traveling cable and is not a traction or suspension rope for elevators. Therefore, it does not disclose a rope that can be used to move an elevator car. Puzik, as discussed above, is a continuous belt for a belt drive mechanism. One skilled in the art of belt drive mechanisms would not look at electrical cables for use with drive belts.

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[9] In re Fritch, 23 U.S.P.Q. 2d. 1780 (Fed. Cir. 1992), In re Piasecki, 745 F.2d. 1468, 1471-1472, 223 U.S.P.Q. 785, 787-788 (Fed. Cir. 1984).

[10] Carl Schenck, A.G. v. Nortron Corp., 713 F.2d 782, 218 U.S.P.Q. 698 (Fed. Cir. 1983); Carman Industries v. Wahl, 724 F.2d 932, 220 U.S.P.Q. 481 (Fed. Cir. 1983).

[11] Lewmar Marine, Inc. v. Barient, Inc., 827 F.2d 744, 3 U.S.P.Q.2d 592 (Fed. Cir. 1983).

[12] Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 U.S.P.Q.2d 1315 (Fed. Cir. 1988); In re Chupp, 816 F.2d 643, 2 U.S.P.Q.2d 1437 (Fed. Cir. 1987); Fromson v. Advanced Offset Plate, 755 F.2d 1549, 225 U.S.P.Q. 26 (Fed. Cir. 1985).

[13] In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

[14] Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 U.S.P.Q.592 (Fed. Cir. 1983); W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); In re Dow Chemical Co., 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

[15] Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1966).

Second, the combination, even if proper, does not disclose or suggest Applicants' invention as claimed in Claims 3 and 4. Puzik discloses a drive belt to transfer rotational energy from a first pulley to a second pulley. Coleman discloses a traveling cable to provide electrical power to a car. There is no disclosure in Puzik or Coleman of a tension member to provide lifting force to a car of an elevator.

(7) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 12 and 17 as unpatentable over Greening in view of Coleman?

Applicants respectfully submit that the Examiner has not met the burden of proof required to support a rejection under 35 U.S.C. §103. When an application is submitted to the Patent and Trademark Office, case law dictates that 35 U.S.C. §103 places the burden of proof on the PTO to establish a prima facie case of obviousness.[16] Once the prima facie case has been established, then the burden of going forward with the evidence to rebut the prima facie case shifts to the applicant. Only the burden of going forward with evidence to rebut shifts to the applicant, however. The burden of persuasion remains with the PTO.

Further, in order to support a prima facie obviousness type rejection, the Examiner must take into account all the limitations in the rejected claim[17], including any limitations expressed using functional language[18]. Further, the obviousness must be determined based on the claimed subject matter as a whole, including any results and advantages produced by the claimed subject matter[19]. In addition, a prima facie case of obviousness in not proper and cannot be made if the suggested modification of a reference destroys the intent, purpose or function of the invention disclosed in the reference[20]. Finally, if the prior art actually teaches away from the claimed invention, this is highly probative, objective criteria fully capable of serving as a foundation for

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[16] In re Fritch, 23 U.S.P.Q. 2d. 1780 (Fed. Cir. 1992), In re Piasecki, 745 F.2d. 1468, 1471-1472, 223 U.S.P.Q. 785, 787-788 (Fed. Cir. 1984).

[17] Carl Schenck, A.G. v. Nortron Corp., 713 F.2d 782, 218 U.S.P.Q. 698 (Fed. Cir. 1983); Carman Industries v. Wahl, 724 F.2d 932, 220 U.S.P.Q. 481 (Fed. Cir. 1983).

[18] Lewmar Marine, Inc. v. Barient, Inc., 827 F.2d 744, 3 U.S.P.Q.2d 592 (Fed. Cir. 1983).

[19] Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 U.S.P.Q.2d 1315 (Fed. Cir. 1988); In re Chupp, 816 F.2d 643, 2 U.S.P.Q.2d 1437 (Fed. Cir. 1987); Fromson v. Advanced Offset Plate, 755 F.2d 1549, 225 U.S.P.Q. 26 (Fed. Cir. 1985).

[20] In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

patentability[21] and defeats a rejection's authority as establishing prima facie obviousness[22].

Applicants respectfully disagree with this rejection. First, the combination of these references is not proper. Coleman, as discussed previously, is a traveling cable for providing electrical power to an elevator car and not a traction or suspension rope for an elevator. Therefore, it does not disclose a rope that can be used to move an elevator car. Greening discloses the use of conventional round, wire ropes as the tension member in elevators. As discussed above, one skilled in the art of traction ropes for elevators would not look at electrical cables for use as an elevator hoist rope.

Second, the combination, even if proper, does not disclose or suggest Applicants' invention as claimed in Claim 12 or 17.

As for Claim 12, there is no disclosure in Greening or Coleman, or the combination of the two references, of a tension member having a coating layer with an engagement surface that is shaped by the outer surface of the ropes within the coating layer in such a manner to enhance the traction of the tension member during use with a traction sheave.

As for Claim 17, there is no disclosure in Greening or Coleman, or the combination of the two references, of a tension member having a coating layer with an engagement surface that is shaped by the outer surface of the ropes within the coating layer in such a manner to guide the tension member during engagement with a sheave.

Therefore, this rejection of Claims 12 and 17 fails to meet the requirements of a proper rejection under 35 U.S.C. 103(a) and should be reversed.

(9) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 21 and 22 as unpatentable over either Coleman or Puzik?

Applicants respectfully submit that the Examiner has not met the burden of proof required to support a rejection under 35 U.S.C. §103. When an application is submitted to

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[21] Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 U.S.P.Q.592 (Fed. Cir. 1983); W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); In re Dow Chemical Co., 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

[22] Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1966).

the Patent and Trademark Office, case law dictates that 35 U.S.C. §103 places the burden of proof on the PTO to establish a prima facie case of obviousness.[23] Once the prima facie case has been established, then the burden of going forward with the evidence to rebut the prima facie case shifts to the applicant. Only the burden of going forward with evidence to rebut shifts to the applicant, however. The burden of persuasion remains with the PTO.

Further, in order to support a prima facie obviousness type rejection, the Examiner must take into account all the limitations in the rejected claim[24], including any limitations expressed using functional language[25]. Further, the obviousness must be determined based on the claimed subject matter as a whole, including any results and advantages produced by the claimed subject matter[26]. In addition, a prima facie case of obviousness in not proper and cannot be made if the suggested modification of a reference destroys the intent, purpose or function of the invention disclosed in the reference[27]. Finally, if the prior art actually teaches away from the claimed invention, this is highly probative, objective criteria fully capable of serving as a foundation for patentability[28] and defeats a rejection's authority as establishing prima facie obviousness[29].

As discussed previously, Coleman discloses a traveling cable, not a traction rope, and Puzik discloses a continuous belt for a belt drive mechanism. Therefore, neither reference, nor their combination if proper, teaches or suggests a tension member as claimed in Claims 21 or 22.

Further, and as acknowledged in the first Office Action, neither reference discloses a tension member having individual ropes that are themselves non-round (Claim 21) or flat (Claim 22) in cross-section. The advantage of such ropes is an

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[23] In re Fritch, 23 U.S.P.Q. 2d. 1780 (Fed. Cir. 1992), In re Piasecki, 745 F.2d. 1468, 1471-1472, 223 U.S.P.Q. 785, 787-788 (Fed. Cir. 1984).

[24] Carl Schenck, A.G. v. Nortron Corp., 713 F.2d 782, 218 U.S.P.Q. 698 (Fed. Cir. 1983); Carman Industries v. Wahl, 724 F.2d 932, 220 U.S.P.Q. 481 (Fed. Cir. 1983).

[25] Lewmar Marine, Inc. v. Barient, Inc., 827 F.2d 744, 3 U.S.P.Q.2d 592 (Fed. Cir. 1983).

[26] Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 U.S.P.Q.2d 1315 (Fed. Cir. 1988); In re Chupp, 816 F.2d 643, 2 U.S.P.Q.2d 1437 (Fed. Cir. 1987); Fromson v. Advanced Offset Plate, 755 F.2d 1549, 225 U.S.P.Q. 26 (Fed. Cir. 1985).

[27] In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

[28] Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 U.S.P.Q.592 (Fed. Cir. 1983); W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); In re Dow Chemical Co., 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

[29] Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1966).

improved load distribution in both the individual ropes and the coating layer. This provides the additional benefits of enhanced flexibility and smaller permissible bending radius.

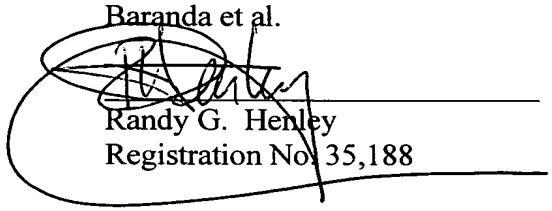
As a result, this combination of references fails to teach each and every element of the claimed inventions of Claims 21 and 22. Therefore, this rejection of Claims 21 and 22 should be reversed.

CONCLUSION

As Applicants have traversed each and every rejection raised by the Examiner, it is respectfully requested that the rejections be reversed and the rejected claims be passed to issue. Please charge any additional fees or credit overpayment to Deposit Account No. 15-0750, Order No. OT-4190.

Respectfully submitted,

Baranda et al.



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9. APPENDIX

Claims involved in the Appeal:

2. A tension member for providing lifting force to a car of an elevator system, the tension member being engageable with a rotatable sheave of the elevator system, the tension member having a width w, a thickness t measured in the bending direction, and an engagement surface defined by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, the tension member including a plurality of individual load carrying ropes encased within a common layer of coating, the coating layer separating the individual ropes, wherein the coating layer defines the engagement surface for engaging the sheave.

3. The tension member according to Claim 2, wherein the individual ropes are formed from strands of non-metallic material.

4. A tension member for providing lifting force to a car of an elevator system, the tension member being engageable with a rotateable sheave of the elevator system, the tension member having a width w, a thickness t measured in the bending direction, and an engagement surface defined by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, wherein the tension member is formed from strands of non-metallic material.

5. The tension member according to Claim 2, wherein the coating layer blocks differential longitudinal motion of the plurality of individual ropes.

6. The tension member according to Claim 5, wherein the coating layer retains each of the ropes to block the occurrence of differential motion.

7. The tension member according to Claim 2, wherein the aspect ratio is greater than or equal to two.

8. The tension member according to Claim 2, wherein the individual ropes are spaced widthwise within the common coating layer.

9. The tension member according to Claim 2, wherein the coating layer defines a single engagement surface for the plurality of individual ropes.

10. The tension member according to Claim 9, wherein the coating layer extends widthwise such that the engagement surface extends about the plurality of individual ropes.

11. A tension member for providing lifting force to a car of an elevator system, the tension member being engageable with a non-linear engagement surface of a rotateable sheave of the elevator system, the tension member having a width w, a thickness t measured in the bending direction, and an engagement surface defined by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, and wherein the engagement surface of the tension member is contoured to complement the non-linear engagement surface of the sheave.

12. The tension member according to Claim 2, wherein the engagement surface of the coating layer is shaped by the outer surface of the ropes to enhance the traction between the traction sheave and the traction member.

13. A tension member for providing lifting force to a car of an elevator system, the tension member being engageable with a rotatable sheave of the elevator system, the tension member having a width w, a thickness t measured in the bending direction, and an engagement surface defined by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, the tension member including a coating layer formed from an elastomer.

14. The tension member according to Claim 2, wherein the coating layer is formed from an elastomer.

16. A tension member for providing lifting force to a car of an elevator system, the tension member being engageable with a rotatable sheave of the elevator system, the tension member having a width w, a thickness t measured in the bending direction, and an engagement surface defined by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, wherein the engagement surface is shaped to guide the tension member during engagement with the sheave.

17. The tension member according to Claim 2, wherein the engagement surface of the coating layer is shaped by the outer surface of the ropes to guide the tension member during engagement with the sheave.

18. The tension member according to Claim 2, wherein the plurality of individual ropes are arranged linearly.

19. The tension member according to Claim 8, wherein the plurality of individual ropes are arranged linearly.

20. The tension member according to Claim 2, wherein the individual ropes are round in cross-section.

21. The tension member according to Claim 2, wherein the individual ropes have an aspect ratio, defined as the ratio of width of the individual ropes relative to thickness t of the individual ropes, greater than one.

22. The tension member according to Claim 2, wherein the individual ropes are flat in cross-section.

66. A tension member for a car of a traction elevator system, the tension member being engageable with a rotatable traction sheave of the elevator system, the tension member having a width w, a thickness t, and the tension member including:

an engagement surface that transfers force from the traction sheave to the tension member as a result of traction between the engagement surface and the traction sheave to thereby move the car, the engagement surface defined substantially by the width dimension of the tension member, wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one;

a plurality of individual load carrying ropes; and

a layer of coating, the coating layer separating the individual ropes and defining the engagement surface for engaging the traction sheave;

wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one.

67. A tension member for a car of a traction elevator system, the tension member being engageable with a rotatable traction sheave of the elevator system, the tension member having a width w, a thickness t, and the tension member including:

an engagement surface that transfers force from the traction sheave to the tension member as a result of traction between the engagement surface and the traction sheave to thereby move the car, the engagement surface defined substantially by the width dimension of the tension member; and

strands of non-metallic material;

wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one.

68. A tension member for a car of a traction elevator system, the tension member being engageable with a non-linear engagement surface of a rotatable traction sheave of the elevator system, the tension member having a width w, a thickness t, and the tension member including:

an engagement surface that transfers force from the traction sheave to the tension member as a result of traction between the engagement surface and the traction sheave to thereby move the car, the engagement surface defined substantially by the width dimension of the tension member, and wherein the engagement surface of the tension member is contoured to complement the non-linear engagement surface of the sheave;

wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one.

69. A tension member for a car of a traction elevator system, the tension member being engageable with a rotatable traction sheave of the elevator system, the tension member having a width w, a thickness t, and the tension member including:

an engagement surface that transfers force from the traction sheave to the tension member as a result of traction between the engagement surface and the traction sheave to thereby move the car, the engagement surface defined substantially by the width dimension of the tension member; and

a coating layer formed from an elastomer;

wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one.

70. A tension member for a car of a traction elevator system, the tension member being engageable with a rotatable traction sheave of the elevator system, wherein the sheave includes an engagement surface, the tension member having a width w, a thickness t, and the tension member including:

an engagement surface that transfers force from the traction sheave to the tension member as a result of traction between the engagement surface and the traction sheave to thereby move the car, the engagement surface defined substantially by the width dimension of the tension member, and wherein the engagement surface is shaped to guide the tension member during engagement with the sheave;

wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one.

71. An elevator system including:

a car;

a sheave; and

a tension member engaged with the car, the tension member engaged with the sheave, the tension member having a width w, a thickness t, and wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, the tension member including:

an engagement surface defined by the width dimension of the tension member;

a plurality of individual load carrying ropes; and

a layer of coating, the coating layer separating the individual ropes and defining the engagement surface for engaging the sheave.

72. An elevator system including:

a car;

a sheave; and

a tension member engaged with the car, the tension member engaged with the sheave, the tension member having a width w, a thickness t, and wherein the tension member has an aspect ratio, defined as the ratio of width w relative to thickness t, greater than one, the tension member including:

an engagement surface defined by the width dimension of the tension member; and

strands of non-metallic material.